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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|-----------------------|---------------------|------------------|
| 09/406,368 | 09/28/1999 | FREDERICK M. DISCENZO | 99RE067 | 1531 |

7590 05/20/2004

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EXAMINER

LEE, HWA S

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ART UNIT

[REDACTED]
PAPER NUMBER

2877

DATE MAILED: 05/20/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | |
|------------------------------|------------------------|------------------------|
| Office Action Summary | Application No. | Applicant(s) |
| | 09/406,368 | DISCENZO, FREDERICK M. |
| | Examiner | Art Unit |
| | Andrew H. Lee | 2877 |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 23 April 2004.
- 2a) This action is **FINAL**. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 8-11 and 33-51 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) Claim(s) 8-11 is/are allowed.
- 6) Claim(s) 33-38, 41-51 is/are rejected.
- 7) Claim(s) 39 and 40 is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on _____ is/are: a) accepted or b) objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

| | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date: _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date: _____ | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

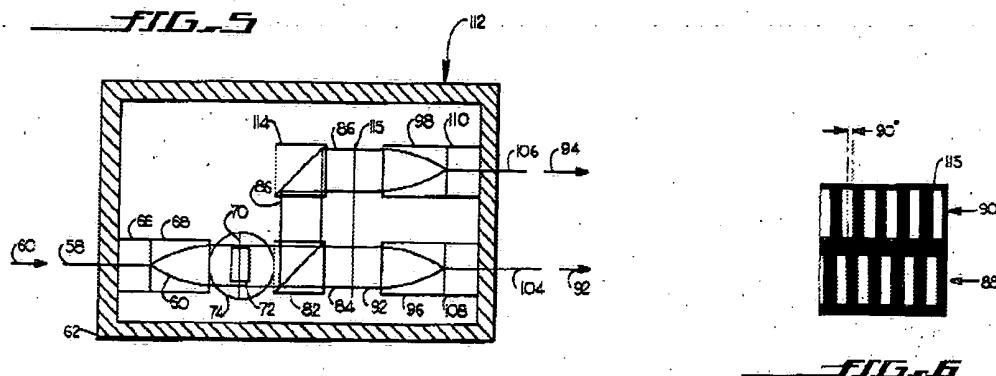
Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.
2. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:
 1. Determining the scope and contents of the prior art.
 2. Ascertaining the differences between the prior art and the claims at issue.
 3. Resolving the level of ordinary skill in the pertinent art.
 4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
3. **Claims 33-38** are rejected under 35 U.S.C. 103(a) as being unpatentable over Udd et al (US 4,471,659).

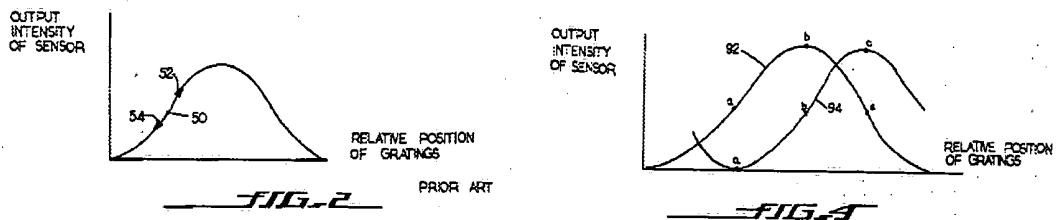
Udd et al (Udd hereinafter) shows an optical vibration sensor comprising:

- a light receiver (188) that receives light from a source;
- an obscuring body (70) that based on a particular vibration state of a machine (184) obscures a portion of light transmitted from the source to the receiver.



Udd does not expressly show a processor analyzes an amount of light received by the light receiver to determine the particular vibration state. Udd however, teaches that a suitable electric processing means is used for quadrature detection (column 4, lines 51+). Udd also teaches that with quadrature detection, a wide range of vibration frequencies and amplitude is determined. Therefore, it would be obvious to one of ordinary skill in the art that the processor that determines quadrature also determines a particular vibration state.

For claims 34 and 35, Figures 2 and 4 show that the amount of light received by the light receiver increases with increased vibration state or that the amount of light received by the light receiver decreases with increased vibration state.



For claim 36, the obscuring body is a light modulating system since the obscuring body is a grating that blocks or transmits light.

For claim 37, the light modulating system includes a housing (112) with a first opening (hole in housing for fiber 58) that receives a light beam, a second opening (hole in housing for

fiber 104 or 106) that allows passage of a light beam to the light receiver as a function of vibration state of the machine.

For claim 38, Udd shows the light modulating system is attached to a machine (184).

4. Claims 41- 51 are rejected under 35 U.S.C. 103(a) as being unpatentable over Udd.

For claims 41, 42, 49 and 51, Udd shows an optical vibration sensor comprising:

a light receiver (96, 98) that receives light from a source;
an obscuring body (70) that based on a particular vibration state of a machine (184) obscures a portion of light transmitted from the source to the receiver.

Udd does not expressly show a processor analyzes an amount of light received by the light receiver to determine the particular vibration state. Udd however, teaches that a suitable electric processing means is used for quadrature detection (column 4, lines 51+). Udd also teaches that with quadrature detection, a wide range of vibration frequencies and amplitude is determined (Abstract). Therefore, it would be obvious to one of ordinary skill in the art that the processor that determines quadrature also determines a particular vibration state such as frequency and amplitude.

For claim 41, the area illuminated on lens 96 and lens 98 determines the intensity of the light received by the detector which in turn indicates vibration.

For claim 42, the obscuring body casts a shadow fringe upon the light receiving arrangement (93, 98, 188) and the remaining light illuminates part or all of the light receiving arrangement as a function of the particular vibration level as can be seen in Figure 4.

For claim 43, Udd shows a reflector (114) that reflects the remaining light onto the light receiving arrangement.

For claim 44, the processor would analyze the area of the light receiving arrangement (96, 98) that is illuminated via the remaining light to determine the particular vibration level of the machine since the total area illuminated on lens 96 and 98 is indicative of the intensity measured by the detector.

For claim 45, since the processor analyzes the area illuminated, one of ordinary skill in the art would recognize that the processor would also be analyzing the area not illuminated since the intensity measured by the detector indicates how much is illuminated versus how much is not illuminated.

For claims 46 and 50, the obscuring body is a light modulating system since the obscuring body is a grating that blocks or transmits light.

For claim 47, Udd shows the light modulating system is attached to a machine (184).

For claim 48, the shadow fringe turns to a complete shadow when the machine reaches a specific vibration level as can be seen in Figure 4.

Allowable Subject Matter

5. Claims 8-11 are allowed.

6. The following is a statement of reasons for the indication of allowable subject matter:
Udd shows a second modulating system in series to the first light modulating system and that one of the first and second modulating system modulates the light beam so as to correspond with the vibration of the machine, however, the prior art, including Udd, fail to show or to suggest that

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both the first and second light modulating system modulates the light beam so as to correspond with the vibration of the machine.

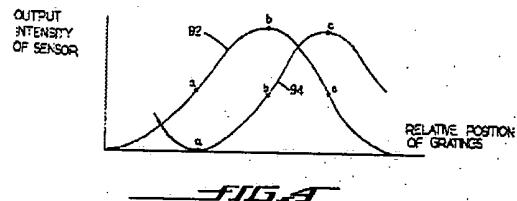
7. **Claims 39 and 40** are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

8. The following is a statement of reasons for the indication of allowable subject matter:
The prior art of record fails to show or to suggest a system that determines a vibration state for a machine comprising of all the elements as presently claimed wherein the light modulating system further comprises an annular structure.

Response to Arguments

1. Applicant's arguments filed 4/23/04 have been fully considered but they are not persuasive. Applicant argues that the Udd does not show a "processor analyzes an amount of light received by the light receiver to determine the particular vibration state," and in particular, that Udd does not show or suggest analyzing an amount of light received. Further, applicant argues that the amount of light received is constant.

2. The examiner respectfully disagrees. Figure 4 shown on the right shows two curves (92 and 94). Each curve represents the intensity (amount) of light measured by each sensor. These intensity signals are sent to the processor where the two signals are used for quadrature (phase) analysis where one intensity signal is compared to the other intensity signal so that a wide range of vibration frequencies and amplitude is determined whereas in the prior art method, only one sensor is used

*FIG. 4*

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to measure the amount of light (intensity) received by the sensor. If the applicant is arguing that the combined signals from the two sensors show a constant amount of light received by the sensors, one can observe from Figure 4 that the combined amount of light received by the sensors at position "a" is smaller than the combined amount of light received by the sensors at position "b". Furthermore, even if the combined amount of light is constant, the prior art disclosed by Udd shows that an amount of light received by the light receiver is not constant and determines the particular vibration state.

Conclusion

3. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Papers related to this application may be submitted to Technology Center (TC) 2800 by facsimile transmission. Papers should be faxed to TC 2800 via the PTO Fax Center located in CP4-4C23. The faxing of such papers must conform with the notice published in the Official

Gazette, 1096 OG 30 (November 15, 1989). The CP4 Fax Center numbers are 703-872-9306 for regular communications and for After Final communications

If the Applicant wishes to send a Fax dealing with either a Proposed Amendment or for discussion for a phone interview then the fax should:

- a) Contain either the statement "DRAFT" or "PROPOSED AMENDMENT" on the Fax Cover Sheet; and
- b) Should be unsigned by the attorney or agent.

This will ensure that it will not be entered into the case and will be forwarded to the examiner as quickly as possible.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andrew Hwa Lee whose telephone number is (703) 305-0538.

The examiner can normally be reached on M-Th. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Frank Font can be reached on 703-308-4881.



Andrew Lee
Patent Examiner
Art Unit 2877

May 11, 2004/ahl



Frank G. Font
Supervisory Patent Examiner
Technology Center 2800